

What is claimed is:

1. A sensor utilizing attenuated total reflection,  
comprising:

a dielectric block;

5 a thin film layer, formed on a surface of said dielectric  
block, for placing a sample thereon;

a light source for emitting a light beam;

10 an optical system for making said light beam enter said  
dielectric block at various angles of incidence so that the  
condition for total internal reflection is satisfied at an  
interface between said dielectric block and said thin film layer;  
and

15 photodetection means for detecting said attenuated  
total reflection by measuring the intensity of said light beam  
satisfying total internal reflection at said interface;

wherein a semiconductor light emitting element that  
emits light by super radiance is employed as said light source.

2. A sensor utilizing attenuated total reflection,  
comprising:

20 a dielectric block;

a metal film, formed on a surface of said dielectric  
block, for placing a sample thereon;

a light source for emitting a light beam;

25 an optical system for making said light beam enter said  
dielectric block at various angles of incidence so that the  
condition for total internal reflection is satisfied at an

interface between said dielectric block and said metal film;  
and

photodetection means for detecting said attenuated  
total reflection that results from surface plasmon resonance  
5 by measuring the intensity of said light beam satisfying total  
internal reflection at said interface;

wherein a semiconductor light emitting element that  
emits light by super radiance is employed as said light source.

3. A sensor utilizing attenuated total reflection,  
10 comprising:

a dielectric block;

a cladding layer formed on a surface of said dielectric  
block;

an optical waveguide layer, formed on said cladding  
15 layer, for placing a sample thereon;

a light source for emitting a light beam;

an optical system for making said light beam enter said  
dielectric block at various angles of incidence so that the  
condition for total internal reflection is satisfied at an  
20 interface between said dielectric block and said cladding layer;  
and

photodetection means for detecting said attenuated  
total reflection that results from excitation of a waveguide  
mode in said optical waveguide layer by measuring the intensity  
25 of said light beam satisfying total internal reflection at said  
interface;

wherein a semiconductor light emitting element that emits light by super radiance is employed as said light source.